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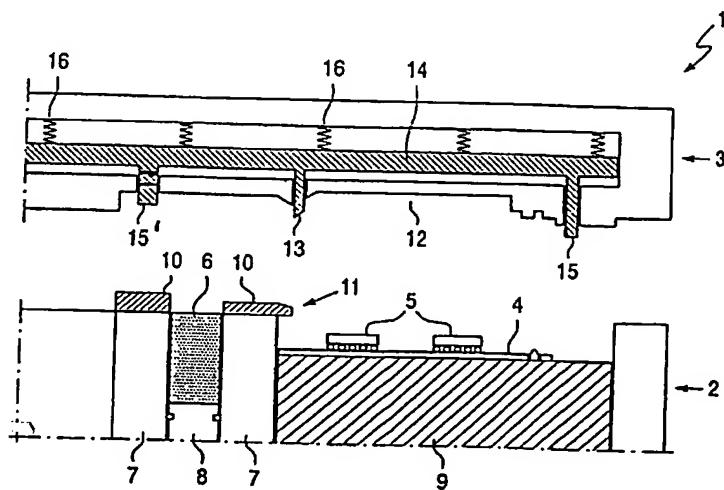
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(54) Title: DEVICE AND METHOD FOR ENCAPSULATING WITH ENCAPSULATING MATERIAL AND ELECTRONIC COMPONENT FIXED ON A CARRIER



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(57) Abstract: The invention relates to a device for encapsulating with encapsulating material an electronic component, in particular a semiconductor, fixed on a carrier, comprising: two co-acting mould parts which are displaceable relative to each other between an encapsulating position, in which the mould parts, when closing onto the carrier, occupy a position for defining at least one mould cavity, and an opened position in which the mould parts are situated at a greater distance from each other than in the encapsulating position, and feed means for encapsulating material connecting onto the mould cavity. The invention also relates to a method for encapsulating with encapsulating material an electronic component fixed on a carrier.



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**A. CLASSIFICATION OF SUBJECT MATTER**  
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**B. FIELDS SEARCHED**

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**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 1995, no. 10, 30 November 1995 (1995-11-30) & JP 07 183317 A (MATSUSHITA ELECTRIC IND CO LTD), 21 July 1995 (1995-07-21) the whole document -& JP 07 183317 A (MATSUSHITA ELECTRIC IND CO LTD) 21 July 1995 (1995-07-21) -----	1-17
X	PATENT ABSTRACTS OF JAPAN vol. 1995, no. 11, 26 December 1995 (1995-12-26) & JP 07 205214 A (PACK VISION:KK), 8 August 1995 (1995-08-08) the whole document -& JP 07 205214 A (PACK VISION:KK) 8 August 1995 (1995-08-08) -----	1-17
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Patent family members are listed in annex.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 01/17012 A (VERMEULEN RICHARD THEODORUS ; FICO BV (NL); PETERS HENDRIKUS JOHANNES) 8 March 2001 (2001-03-08) the whole document -----	1-17
Y	EP 0 726 598 A (FICO BV) 14 August 1996 (1996-08-14) the whole document -----	1-17
A	PATENT ABSTRACTS OF JAPAN vol. 0164, no. 99 (E-1280), 15 October 1992 (1992-10-15) & JP 04 184944 A (CITIZEN WATCH CO LTD), 1 July 1992 (1992-07-01) -& JP 04 184944 A (CITIZEN WATCH CO LTD) 1 July 1992 (1992-07-01) the whole document -----	
A	PATENT ABSTRACTS OF JAPAN vol. 0062, no. 26 (E-141), 11 November 1982 (1982-11-11) & JP 57 128930 A (YAMAGATA NIPPON DENKI KK), 10 August 1982 (1982-08-10) -& JP 57 128930 A (YAMAGATA NIPPON DENKI KK) 10 August 1982 (1982-08-10) the whole document -----	
A	PATENT ABSTRACTS OF JAPAN vol. 1995, no. 06, 31 July 1995 (1995-07-31) & JP 07 080895 A (OLYMPUS OPTICAL CO LTD), 28 March 1995 (1995-03-28) abstract -----	

# INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report		Publication date		Patent family member(s)		Publication date
JP 07183317	A	21-07-1995	US	5779958 A		14-07-1998
JP 7183317	A	21-07-1995	US	5779958 A		14-07-1998
JP 07205214	A	08-08-1995	NONE			
JP 7205214	A	08-08-1995	NONE			
WO 0117012	A	08-03-2001	NL	1012488 C2		03-01-2001
			EP	1259981 A1		27-11-2002
			JP	2003508911 T		04-03-2003
			WO	0117012 A1		08-03-2001
			TW	421868 B		11-02-2001
EP 0726598	A	14-08-1996	NL	9500238 A		02-09-1996
			CN	1137441 A		11-12-1996
			DE	69632095 D1		13-05-2004
			DE	69632095 T2		14-04-2005
			EP	0726598 A1		14-08-1996
			HK	1014081 A1		15-10-2004
			JP	3221827 B2		22-10-2001
			JP	8276461 A		22-10-1996
			SG	42885 A1		17-10-1997
			US	6019588 A		01-02-2000
			US	5766650 A		16-06-1998
JP 04184944	A	01-07-1992	JP	2977889 B2		15-11-1999
JP 4184944	A	01-07-1992	JP	2977889 B2		15-11-1999
JP 57128930	A	10-08-1982	JP	1379301 C		28-05-1987
			JP	61046049 B		11-10-1986
JP 07080895	A	28-03-1995	NONE			